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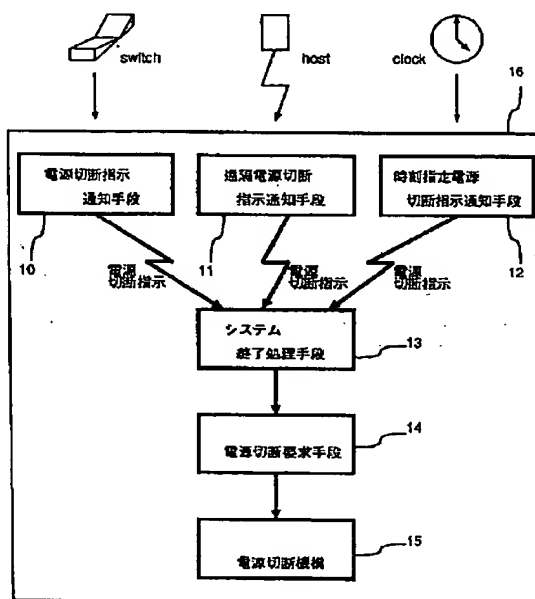
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(54) 【発明の名称】 電源切断方式

(57) 【要約】

【目的】 電子計算機システムの電源切断方式において、不意に電源切断要因が発生した場合でも通常通り次回立ち上げが行えるようにする。さらに電源切断時オペレーションを容易とする。

【構成】 電源スイッチの切断による電源切断指示を通知する電源切断指示通知手段10と、遠隔地からの電源切断指示を通知する遠隔電源切断指示通知手段11と、予め指定された電源切断予定時刻になったとき電源切断指示を通知する時刻指定電源切断指示通知手段12とを備え、電源切断指示通知手段10、遠隔電源切断指示通知手段11、或は時刻指定電源切断指示通知手段12にてそれぞれが対応する電源切断要因を検出し電源切断指示を通知し、通知を受けたシステム終了処理手段13は、システムの整合性を保つための種々の処理を行い、電源切断要求手段14は電源切断機構15に要求を行い、電子計算機システム16の電源を切断する。



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## 【特許請求の範囲】

【請求項1】 電源切断機構を有する電子計算機システムにおいて、電源スイッチの切断による電源切断指示を通知する電源切断指示通知手段と、前記電源切断指示通知手段により電源切断を指示されたときシステム内の整合性を保つための終了処理を行うシステム終了処理手段と、前記システム終了処理手段の終了後に前記電源切断機構に要求しシステムの電源を切断する電源切断要求手段とで構成されることを特徴とした電源切断方式。

【請求項2】 電源切断機構を有する電子計算機システムにおいて、遠隔地からの電源切断指示を通知する遠隔電源切断指示通知手段と、前記遠隔電源切断指示通知手段により電源切断を指示されたときシステム内の整合性を保つための終了処理を行うシステム終了処理手段と、前記システム終了処理手段の終了後に前記電源切断機構に要求しシステムの電源を切断する電源切断要求手段とで構成されることを特徴とした電源切断方式。

【請求項3】 電源切断機構を有する電子計算機システムにおいて、予め指定された電源切断予定時刻になったとき電源切断指示を通知する時刻指定電源切断指示通知手段と、前記時刻指定電源切断指示通知手段により電源切断指示を通知されたときシステム内の整合性を保つための終了処理を行うシステム終了処理手段と、前記システム終了処理手段の終了後に前記電源切断機構に要求しシステムの電源を切断する電源切断要求手段とで構成されることを特徴とした電源切断方式。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は電子計算機システムの電源の切断方式に関するものである。

## 【0002】

【従来の技術】 従来、電子計算機システムの電源切断は一貫してハードウェアにより行われていた。また、電源の切断は電源切断要因発生時に即座に行われていた。

## 【0003】

【発明が解決しようとする課題】 上述した従来の電源切断方式では、次回立ち上げ時の整合性を保つために終了処理を必要とするオペレーティングシステムの場合、不意に電源切断要因が発生すると次回立ち上げに支障を来すことがあった。

【0004】 本発明の目的は不意に電源切断要因が発生した場合でも通常通り次回立ち上げが行える電子計算機システムの電源切断方式を提供することにある。

## 【0005】

【課題を解決するための手段】 本発明の第1の電源切断方式では、電源スイッチの切断による電源切断指示を通知する電源切断指示通知手段と、前記電源切断指示通知手段により電源切断を指示されたときシステム内の整合性を保つための終了処理を行うシステム終了処理手段と、前記システム終了処理手段の終了後に前記電源切断

機構に要求しシステムの電源を切断する電源切断要求手段とで構成され、電源切断要因発生後に終了処理を行う制御方式をとっている。

【0006】 本発明の第2の電源切断方式では、遠隔地からの電源切断指示を通知する遠隔電源切断指示通知手段と、前記遠隔電源切断指示通知手段により電源切断を指示されたときシステム内の整合性を保つための終了処理を行うシステム終了処理手段と、前記システム終了処理手段の終了後に前記電源切断機構に要求しシステムの電源を切断する電源切断要求手段とで構成され、電源切断要因発生後に終了処理を行う制御方式をとっている。

【0007】 本発明の第3の電源切断方式では、予め指定された電源切断予定時刻になったとき電源切断指示を通知する時刻指定電源切断指示通知手段と、前記時刻指定電源切断指示通知手段により電源切断指示を通知されたときシステム内の整合性を保つための終了処理を行うシステム終了処理手段と、前記システム終了処理手段の終了後に前記電源切断機構に要求しシステムの電源を切断する電源切断要求手段とで構成され、電源切断要因発生後に終了処理を行う制御方式をとっている。

## 【0008】

【実施例】 次に本発明について図面を参照して説明を行う。図1は本発明の全体構成を示したフローチャートである。

【0009】 図中10は電源スイッチの切断による電源切断指示を通知する電源切断指示通知手段である。11は遠隔地からの電源切断指示を通知する遠隔電源切断指示通知手段である。12は予め指定された電源切断予定時刻になったとき電源切断指示を通知する時刻指定電源切断指示通知手段である。電源切断指示通知手段10、遠隔電源切断指示通知手段11、或は時刻指定電源切断指示通知手段12にてそれぞれが対応する電源切断要因を検出し電源切断指示を通知する。通知を受けたシステム終了処理手段13は、システムの整合性を保つための種々の処理を行う。システム終了処理手段13の処理が終了すると、電源切断要求手段14は電源切断機構15に要求を行う。要求を受けた電源切断機構15は電子計算機システム16の電源を切断する。

【0010】 図2は本発明の一実施例を示した機能構成図である。

【0011】 図中200はホスト電子計算機システム210との通信回線201と、電源スイッチ202を備え、割り込み発生機構203と、一次記憶204と、二次記憶205と、電源切断機構206と、内部時計207とをもった電子計算機装置を概念的に示したものである。

【0012】 前記電子計算機装置200はファイル220への書き込みがあった場合に、その内容を一旦前記一次記憶204上のバッファ221へ記憶し、その後、前記二次記憶205上の実際のファイル220へ非同期に

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書き出す方式をとるオペレーティングシステムによって制御される。

【0013】システム管理者により前記電源スイッチ202が押され電源の切断が指示されると、電源切断指示通知手段230は、前記割り込み発生機構203を介して割り込みを発生させ、電源の切断指示を通知する。

【0014】ホスト電子計算機システム210は通信回線201を介して、前記電子計算機装置200の電源切断を指示する。該電源切断指示は遠隔電源切断指示通知手段240が受信する。ホストからの電源切断指示を受信した同遠隔電源切断指示通知手段240は、前記割り込み発生機構203を介して割り込みを発生させ、電源の切断指示を通知する。

【0015】時刻指定電源切断指示通知手段250は、常に前記内部時計207を監視し、時刻が予め設定されている電源切断予定時刻と一致した場合に、前記割り込み発生機構203を介して割り込みを発生させ、電源の切断指示を通知する。

【0016】前記電源切断指示通知手段230、前記遠隔電源切断指示通知手段240、前記時刻指定電源切断指示通知手段250がそれぞれ発生させる割り込みは割り込みハンドラ231が受信する。該割り込みを受信した前記割り込みハンドラ231は、システム終了処理手段232を起動する。前記システム終了処理手段232は、現在オペレーティングシステム内で動作中のプロセス222を、強制的に終了させる。プロセスの強制終了処理を終えた前記システム終了処理手段232は次に、前記一次記憶上のバッファ221に残されているファイルの内容を、前記二次記憶上のファイル220へ書き出す。ファイルの二次記憶への書き出し処理を終えた前記システム終了処理手段232は次に、電源切断要求手段233を起動する。前記電源切断要求手段233は前記割り込み発生機構を介して電源切断機構206に電源切断要求の割り込みを発行する。該割り込みを受けた前記電源切断機構206は電子計算機装置200の電源を切断する。

【0017】

【発明の効果】以上、説明したように本発明の電源切断方式では電源切断要因の発生後に終了処理を行い電源切断することにより、不意に電源切断要因が発生した場合でも通常通り次回立ち上げが行えるという効果がある。

【0018】さらに自動的に終了処理を行うため、電源切断時オペレーションが従来と比べて容易となる。

【図面の簡単な説明】

【図1】本発明の全体構成を示したフローチャート。

【図2】本発明の一実施例を示した機能構成図。

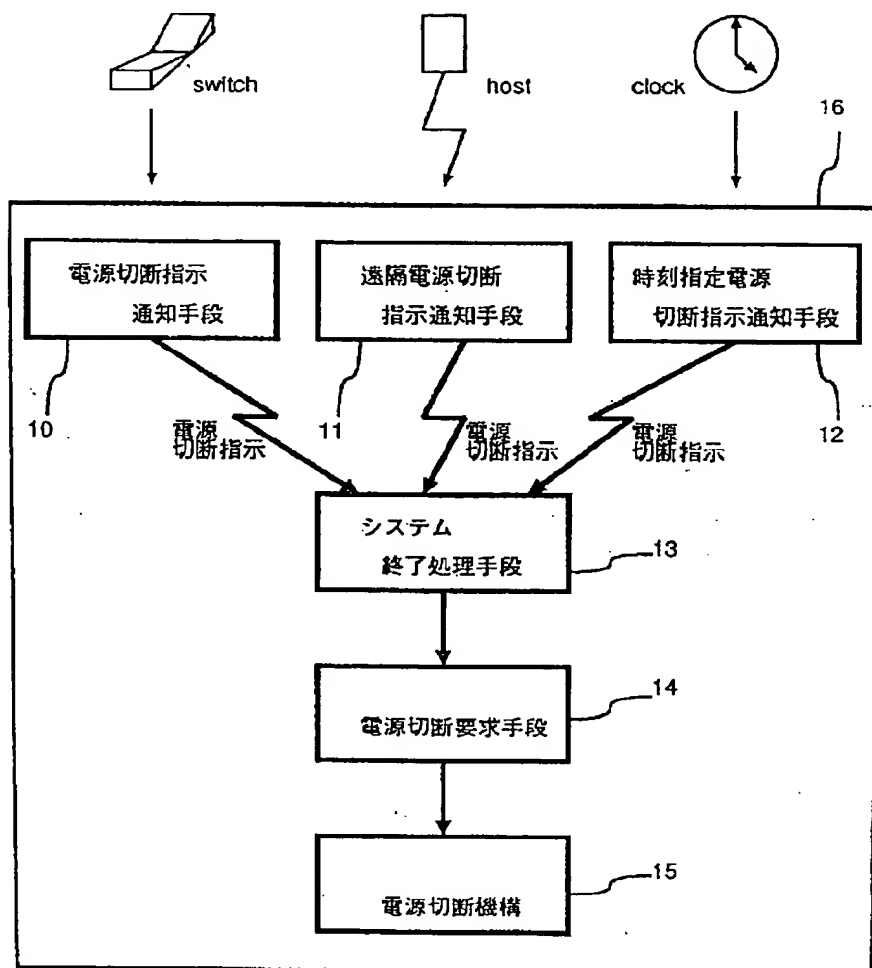
【符号の説明】

10	電源切断指示通知手段
11	遠隔電源切断指示通知手段
12	時刻指定電源切断指示通知手段
13	システム終了処理手段
14	電源切断要求手段
15	電源切断機構
16	電子計算機システム
200	電子計算機装置
201	通信回線
202	電源スイッチ
203	割り込み発生機構
204	一次記憶
205	二次記憶
206	電源切断機構
207	内部時計
210	ホスト電子計算機システム
220	二次記憶上の実際のファイル
221	一次記憶上のバッファ
222	プロセス
230	電源切断指示通知手段
231	割り込みハンドラ
232	システム終了処理手段
233	電源切断要求手段
240	遠隔電源切断指示通知手段
250	時刻指定電源切断指示通知手段

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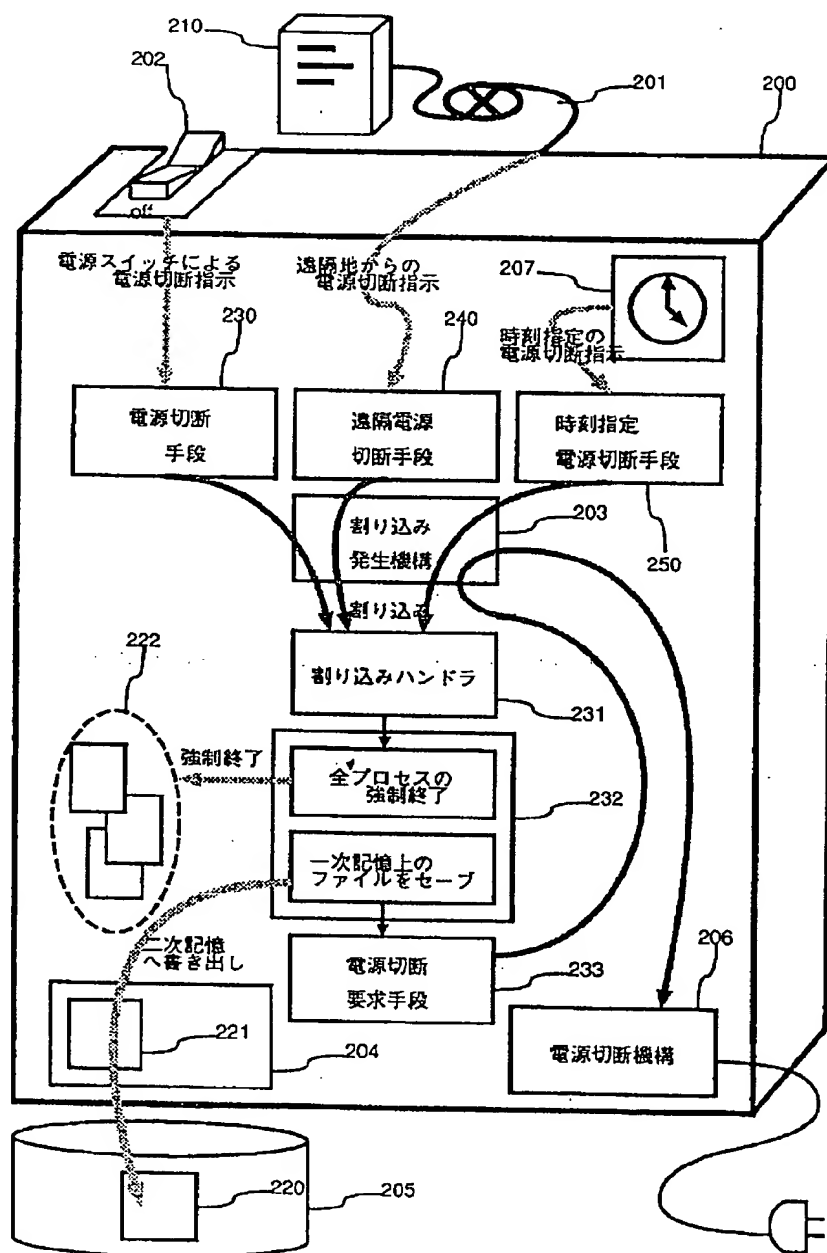
【図1】



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【図2】



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(54) [Title of the Invention] POWER-OFF SYSTEM

(57) [Abstract]

[Object] In a power-off system for an electronic computer system, even if a power-off factor occurs unexpectedly, the electronic computer system can be normally started at the next time. Moreover, a power-off operation is easy to do.

[Construction] A power-off system comprises: a power-off instruction notifying means 10 for notifying about a power-off instruction given by turning off a power switch; a remote power-off instruction notifying means 11 for notifying about a power-off instruction issued from a remote place; and a time-designated power-off instruction notifying means 12 for notifying about a power-off instruction when it is a scheduled power-off time instant designated in advance. The power-off instruction notifying means 10, remote power-off instruction notifying means 11, or time-designated power-off instruction notifying means 12 detects an associated power-off factor, and notifies about a power-off instruction. A system termination processing means 13 having received the notification performs various pieces of processing so as to retain the compatibility of a computer system. A power-off requesting means 14 requests a power-off feature 15 to turn off the power supply of the electronic computer system 16.

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[Claim(s)]

[Claim 1] A power-off system for an electronic computer system having a power-off feature, the power-off system comprising:

a power-off instruction notifying means for notifying about a power-off instruction given by turning off a power switch;

a system termination processing means for performing termination processing, which is required for retaining the compatibility of the computer system, when instructed disconnection of the computer system from a power supply thereof by the power-off instruction notifying means; and

a power-off requesting means for requesting the power-off feature to turn off the power supply of the computer system after termination of the system termination processing means.

[Claim 2] A power-off system for an electronic computer system having a power-off feature, the power-off system comprising:

a remote power-off instruction notifying means for notifying about a power-off instruction issued from a remote place;

a system termination processing means for performing termination processing, which is required for retaining the compatibility of the computer system, when instructed disconnection of the computer system from a power supply thereof by the remote power-off instruction notifying



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means; and

a power-off requesting means for requesting the power-off feature to turn off the power supply of the computer system after termination of the system termination processing means.

[Claim 3] A power-off system for an electronic computer system having a power-off feature, the power-off system comprising:

a time-designated power-off instruction notifying means for notifying about a power-off instruction when it is a scheduled power-off time instant designated in advance;

a system termination processing means for performing termination processing, which is required for retaining the compatibility of the computer system, when notified about the power-off instruction by the time-designated power-off instruction notifying means; and

a power-off requesting means for requesting the power-off feature to turn off the power supply of the computer system after termination of the system termination processing means.

[Detailed Description of the Invention]

[0001]

[Technical Field of the Invention] The present invention relates to a system for turning off the power supply of an electronic computer system.

[0002]

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[Description of the Related Art] In the past, the power supply of an electronic computer system has been turned off by hardware. Moreover, as soon as a power-off factor occurs, the power supply is turned off.

[0003]

[Problems to be Solved by the Invention] In the foregoing conventional power-off system, assuming that an operating system requires termination processing so that the compatibility of a computer system will be retained at the time of the next startup, if a power-off factor occurs unexpectedly, the next startup may be hindered.

[0004] An object of the present invention is to provide a power-off system for an electronic computer system which permits the electronic computer system to normally start up at the next time despite unexpected occurrence of a power-off factor.

[0005]

[Means for Solving the Problems] A first power-off system according to the present invention comprises: a power-off instruction notifying means for notifying about a power-off instruction given by turning off a power switch; a system termination processing means for performing termination processing, which is required for retaining the compatibility of a computer system, when instructed disconnection of the computer system from a power supply thereof by the power-off instruction notifying means; a power-off requesting means for requesting a power-off

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feature to turn off the power supply of the computer system after termination of the system termination processing means. The first power-off system adopts a control mode in which termination processing is performed after occurrence of a power-off factor.

[0006] A second power-off system according to the present invention comprises: a remote power-off instruction notifying means for notifying about a power-off instruction issued from a remote place; a system termination processing means for performing termination processing, which is required for retaining the compatibility of a computer system, when instructed disconnection of the computer system from a power supply thereof by the remote power-off instruction notifying means; and a power-off requesting means for requesting the power-off feature to turn off the power supply of the computer system after termination of the system termination processing means. The second power-off system adopts a control mode in which termination processing is performed after occurrence of a power-off factor.

[0007] A third power-off system according to the present invention comprises: a time-designated power-off instruction notifying means for notifying about a power-off instruction when it is a scheduled power-off time instant designated in advance; a system termination processing means for performing termination processing, which is required for retaining the compatibility of a computer

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system, when notified about the power-off instruction by the time-designated power-off instruction notifying means; and a power-off requesting means for requesting the power-off feature to turn off the power supply of the computer system after termination of the system termination processing means. The third power-off system adopts a control mode in which termination processing is performed after occurrence of a power-off factor.

[0008]

[Embodiments] Referring to drawings, the present invention will be described below. Fig. 1 is a flowchart showing an overall configuration of the present invention.

[0009] In the drawing, reference numeral 10 denotes a power-off instruction notifying means for notifying about a power-off instruction given by turning off a power switch. Reference numeral 11 denotes a remote power-off instruction notifying means for notifying about a power-off instruction issued from a remote place. Reference numeral 12 denotes a time-designated power-off instruction notifying means for notifying about a power-off instruction when it is a scheduled power-off time instant designated in advance. The power-off instruction notifying means 10, remote power-off instruction notifying means 11, or time-designated power-off instruction notifying means 12 detects an associated power-off factor and notifies about a power-off instruction. A system termination processing means 13 having received the notification performs various pieces of

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processing required for retaining the compatibility of a computer system. When the processing performed by the system termination processing means 13 is completed, a power-off requesting means 14 requests a power-off feature 15 to turn off the power supply of the computer system. The power-off feature 15 having received the request turns off the power supply of the electronic computer system 16.

[0010] Fig. 2 shows a functional configuration of an embodiment of the present invention.

[0011] In the drawing, reference numeral 200 denotes a conceptual representation of an electronic computer system comprising a communication line 201 leading to a host electronic computer system 210, a power switch 202, an interrupt generation feature 203, a primary storage 204, a secondary storage 205, a power-off feature 206, and an internal clock 207.

[0012] The electronic computer system 200 is controlled by an operating system that adopts a mode in which: when data is written in a file 220, the contents of the data are temporarily saved in a buffer 221 included in the primary storage 204, and then asynchronously written into the actual file 220 defined in the secondary storage 205.

[0013] When a system manager depresses the power switch 202 so as to instruct disconnection of the computer system from a power supply thereof, the power-off instruction notifying means 230 causes the interrupt generation feature 203 to generate an interrupt and thus notifies about a

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power-off instruction.

[0014] The host electronic computer system 210 instructs disconnection of the electronic computer system 200 from the power supply thereof over the communication line 201. The remote power-off instruction notifying means 240 receives a power-off instruction. The remote power-off instruction notifying means 240 having received the power-off instruction from the host causes the interrupt generation feature 203 to generate an interrupt, and thus notifies about the power-off instruction.

[0015] The time-designated power-off instruction notifying means 250 monitors the internal clock all the time. When a current time instant agrees with a scheduled power-off time instant designated in advance, the time-designated power-off instruction notifying means 250 causes the interrupt generation feature 203 to generate an interrupt, and thus notifies about the power-off instruction.

[0016] An interrupt which each of the power-off instruction notifying means 230, remote power-off instruction notifying means 240, and time-designated power-off instruction notifying means 250 causes the interrupt generation feature to generate is received by an interrupt handler 231. The interrupt handler 231 having received the interrupt activates a system termination processing means 232. The system termination processing means 232 forcibly terminates a process 222 that is in progress in an operating system. After completing the forcible

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termination of the process, the system termination processing means 232 writes the contents of the file, which is left in the buffer 221 included in the primary storage, into the file 220 defined in the secondary storage. After completing the writing of the file into the secondary storage, the system termination processing means 232 activates a power-off requesting means 233. The power-off requesting means 233 causes the interrupt generation feature to issue an interrupt, which carries a power-off request, to the power-off feature 206. The power-off feature 206 having received the interrupt turns off the power supply of the electronic computer system 200.

[0017]

[Advantages] As described so far, the power-off system according to the present invention performs termination processing after occurrence of a power-off factor, and turns off the power supply of a computer system. Even if the power-off factor occurs unexpectedly, the computer system can be normally started at the next time.

[0018] Furthermore, since termination processing is performed automatically, a power-off operation is easier to do than it conventionally is.

[Brief Description of the Drawings]

[Fig. 1] Fig. 1 is a flowchart showing an overall configuration of the present invention.

[Fig. 2] Fig. 2 shows a functional configuration of an embodiment of the present invention.

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## [Description of Reference Numerals]

- 10: power-off instruction notifying means
- 11: remote power-off instruction notifying means
- 12: time-designated power-off instruction notifying means
- 13: system termination processing means
- 14: power-off requesting means
- 15: power-off feature
- 16: electronic computer system
- 200: electronic computer system
- 201: communication line
- 202: power switch
- 203: interrupt generation feature
- 204: primary storage
- 205: secondary storage
- 206: power-off feature
- 207: internal clock
- 210: host electronic computer system
- 220: actual file in the secondary storage
- 221: buffer in the primary storage
- 222: process
- 230: power-off instruction notifying means
- 231: interrupt handler
- 232: system termination processing means
- 233: power-off requesting means
- 240: remote power-off instruction notifying means
- 250: time-designated power-off instruction notifying means



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## FIG. 1

10: POWER-OFF INSTRUCTION NOTIFYING MEANS

11: REMOTE POWER-OFF INSTRUCTION NOTIFYING MEANS

12: TIME-DESIGNATED POWER-OFF INSTRUCTION NOTIFYING MEANS

電源切断指示 POWER-OFF INSTRUCTION

13: SYSTEM TERMINATION PROCESSING MEANS

14: POWER-OFF REQUESTING MEANS

15: POWER-OFF FEATURE

## FIG. 2

電源スイッチによる電源切断指示

POWER-OFF INSTRUCTION GIVEN BY TURNING OFF POWER SWITCH

遠隔地からの電源切断指示

POWER-OFF INSTRUCTION ISSUED FROM REMOTE PLACE

時刻指定の電源切断指示

POWER-OFF INSTRUCTION ISSUED AT DESIGNATED TIME INSTANT

230: POWER-OFF MEANS

240: REMOTE POWER-OFF MEANS

250: TIME-DESIGNATED POWER-OFF MEANS

203: INTERRUPT GENERATION FEATURE

割り込み INTERRUPT

231: INTERRUPT HANDLER

強制終了 FORCIBLE TERMINATION

232:

全プロセスの強制終了 FORCIBLE TERMINATION OF ENTIRE PROCESS

一次記憶上のファイルをセーブ SAVING FILE IN PRIMARY STORAGE

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二次記憶へ書き出し WRITING INTO SECONDARY STORAGE

233: POWER-OFF REQUESTING MEANS

206: POWER-OFF FEATURE

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